Prenatal Care

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Learning Objectives

- Understand and apply the concepts of preconception healthcare
- List the components of and understand the rational for the initial prenatal assessment
- Describe the purpose for and components of routine prenatal care visits

Goals of Preconception Care

- Identify modifiable and non-modifiable risk factors for poor obstetrical outcomes prior to conception
- Provide an opportunity to intervene when modifiable risk factors are identified
- Provide preventative healthcare
- Perform individualized counseling including information on the benefits of planned pregnancy

Key Components

- Genetic risk assessment
- Prevention of congenital infections
- Screening for environmental toxins
- Assessment of chronic diseases

Genetic Risk Assessment

- Prevent neural tube defects (NTD)
  - Folic acid reduces incidence of NTDs
  - Recommend minimum 400 mcg/day folic acid
  - Higher dosing necessary if diabetic, epileptic or delivered prior infant with NTD
- Counsel about risks of advanced maternal age
- Assess need for carrier screening

Prevention of Congenital Infections

- HIV & Syphilis: preconception identification and treatment reduces transmission
- Toxoplasmosis/ CMV/ParvoB19 screening not advised…but education is!
- Immunizations:
  - Hepatitis B
    - Immunize those at risk
    - Safe in pregnancy
  - Rubella and varicella
    - Assess for immunity
    - Vaccinate nonimmune
    - LIVE Virus: delay conception x 3 months

Screen for Toxins & Exposures

- Does she smoke? Can you help her stop?
- Does she drink? How much?
- Does she use drugs?
- Does she have any concerning occupational, environment or household exposures?

Chronic Disease Assessment

- Identify any preexisting medical conditions which may impact patient or a fetus
- Maximize pre-pregnancy health prior to conception
- Minimize use of potentially teratogenic medications

Prenatal Assessment

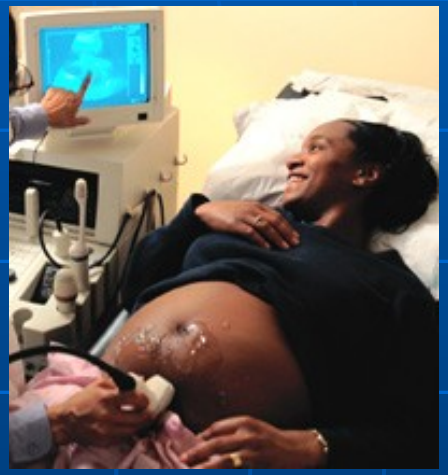
- Purpose:
  - To perform a baseline assessment of risk factors for pregnancy complications
  - To establish care plan with referral as needed
  - To treat any identified disease conditions
  - Provide patient education

Prenatal Screening Exam

- Physical exam: why do we do it?
  - Complete exam with pelvimetry & fetal heart tones recommended
  - Only BP, wt, and ht assessments have been associated with improved outcomes
- Initial Screening Labs:
  - ABO & antibody screen, Hgb/Hct, Rubella, PAP smear, RPR, GC/Chlamydia, Urine culture, Hep B, HIV

Educating our patients

- Plan of care
- Nutrition
- Weight gain
- Exercise
- Early warning signs
- Common discomforts
- Breastfeeding
- Domestic violence



Routine Prenatal Care

Routine Prenatal Care

- Purpose: Continues risk assessment and preventative counseling
- Timing & Frequency: A subject of debate
- Key components:
  - History: what are you looking for?
  - Exam: BP, weight, fundal height, doptones
- Prevention: Influenza vaccine
- Patient Education

When do I get my ultrasound?

- Routine ultrasound....
  - Improves patient satisfaction
  - Detects twin gestations earlier
  - Reduces rate of induction for postdates pregnancy
  - Provides earlier detection of clinically unsuspected fetal malformations
  - Further significant benefits are unclear

Screening in 1st and 2nd trimester

- Cystic fibrosis screening
- Multiple marker testing
- Preventing isoimmunization
- Gestational diabetes screening

Cystic Fibrosis 101

- Most common autosomal recessive disease
  - Carrier frequency 1/29 in Caucasians
  - Incidence 1/3300 live births
- Mutations in the CFTR gene
- Defective chloride channel function
- Clinical triad: 1) pancreatic insufficiency, 2) chronic suppurative pulmonary disease, and 3) salt loss in sweat

Cystic Fibrosis: why do we screen?

- To identify carriers in at risk populations to help with reproductive decision making
- To allow time for education if a fetus with CF is identified
- To enable individuals to terminate the pregnancy of a fetus with CF
- To institute treatments earlier to prevent complications of the disease

Who do you screen?

- Screening should be “offered” to
  - Individuals with a family history of CF
  - Reproductive partners of individuals with CF
  - Couples in whom one or both are Caucasian and are planning pregnancy or seeking prenatal care
- Screening should be “made available”
  - “to couples in other racial and ethnic groups who are lower risk and in whom the test may be less sensitive”

ACOG, ACMG. 2001.

Screening Method

- DNA sample obtained for multi-mutation analysis
- Pan-ethnic panel including all mutations with an allele frequency of at least 0.1%
  - Current panel: 25 mutations
- Sequential vs. concurrent screening

Interpreting the Results

- Risk estimation
  - Directly related to ancestry
  - Sensitivity is a function of number of mutations searched for in the panel
- Negative screen *does not* mean no risk
- Remaining risk=Residual risk

Dealing with Positive Results

- For the individual identified as a carrier:
  - Recommend testing of father of baby ASAP
  - Consider offering genetic counseling
- For the couple who are both positive:
  - Chance of having an affected baby 1 in 4
  - Prompt referral for genetic counseling with discussion of prenatal testing

Multiple Marker Testing

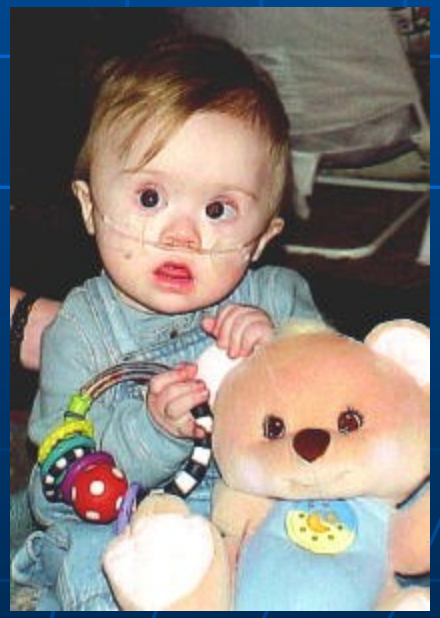
- Screening test for
  - Down Syndrome (trisomy 21)
  - Edward's Syndrome (trisomy 18)
  - Neural tube defects
- Measures circulating levels of
  - Alpha-fetoprotein (AFP)
  - Unconjugated estriol
  - Human chorionic gonadotorpin (hCG)

Multiple Marker Testing

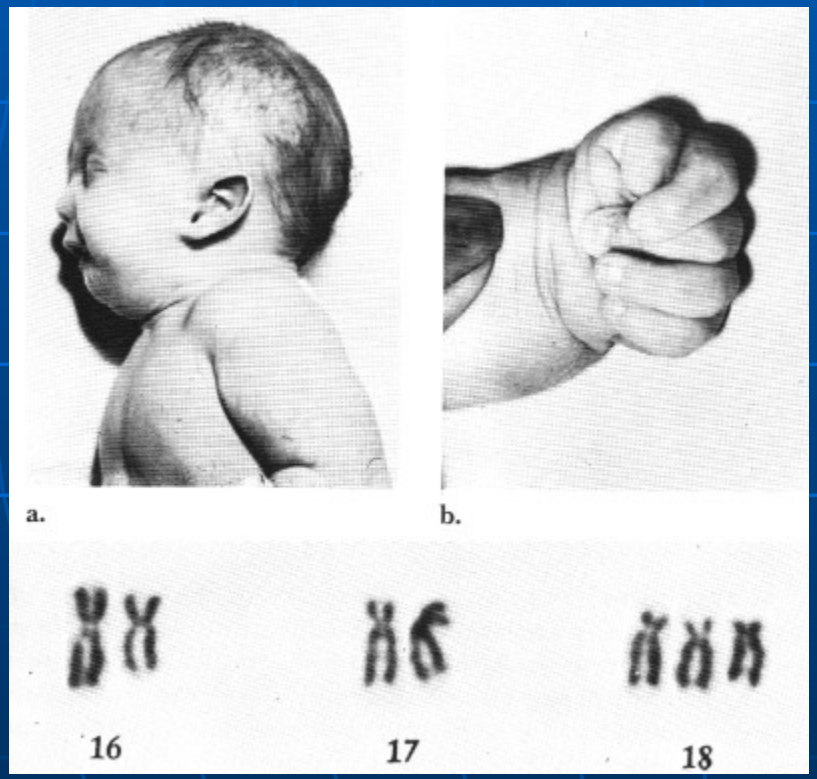
- When do we screen?
  - USPTF recommends offering test between 15-18 weeks
- What are the results?
  - Values reported as multiples of the median (MOM)
  - Abnormal screen:
    - MSAFP $\geq$ 2.5 MOM
    - Mid-trimester risk $\geq$ 1:270 for Down syndrome

Down Syndrome (Trisomy 21)

- 1/800 Live births
- Risk increases with advancing maternal age
- Lab findings
  - Elevated hCG
  - Lower than average levels MSAFP and unconjugated estriol



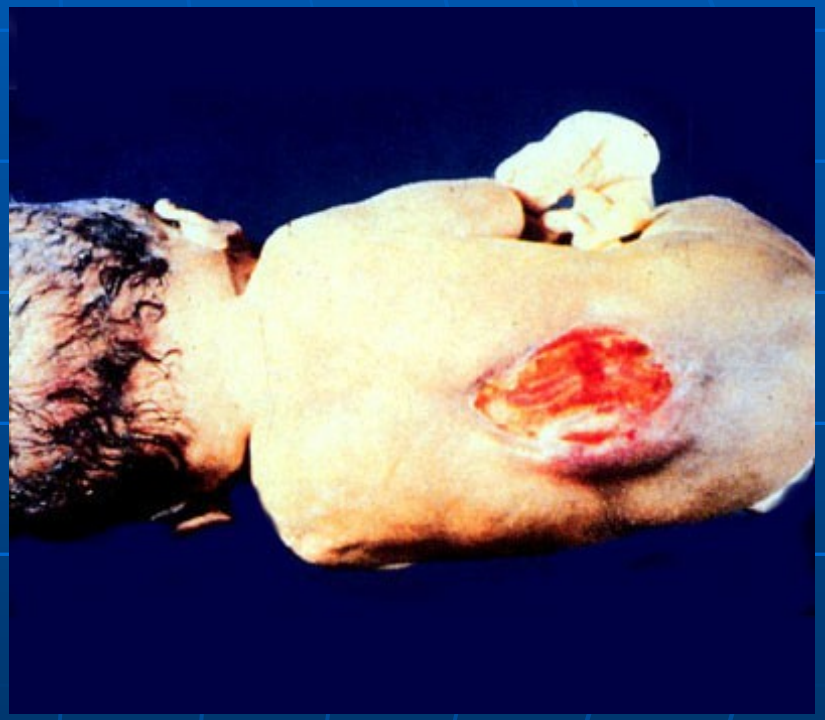
Edward's Syndrome (Trisomy 18)



- 1/5000 live births
- High rate of fetal and neonatal death
- Lab findings:
  - Lower than average levels of all three markers

Open Neural Tube Defect

- 7-15/10,000 live births
- Adequate folic acid reduces incidence
- Lab findings:
  - Elevated MSAFP



Approach to the Abnormal Result

- Confirm dates and number of fetuses
- Consider repeat testing if drawn prior to 15 wks EGA
- Genetics consult with level II ultrasound ± amniocentesis
- Fetal surveillance if evaluation is negative

Preventing Isoimmunization

- Why?
  - Rh negative women are at risk of developing antibodies to the Rh antigen on fetal cells
  - Once sensitized, subsequent Rh positive fetus is at risk for severe hemolysis
  - Anti-D immunoglobulin markedly reduces risk of isoimmunization

Preventing Isoimmunization

- Who & when?
  - Screen all women at initial visit with ABO and antibody screen
- Treat Rh negative women with Rho D immunoglobulin (300 mg IM of RhoGAM)
  - Routinely at 28 wks to all Rh neg women
  - With 72 hrs postpartum if infant is Rh +
  - After episodes of vaginal bleeding, pregnancy loss, invasive procedures, or trauma

Screening for Gestational Diabetes

- Why screen:
  - Identify women at risk for AODM in future
  - Treat in an attempt to reduce maternal, fetal and neonatal morbidity
- Performed at 24-28 wks EGA
- Who? selective vs. universal screening debated

Risk Factors for Selective Screening

- Age > 25 yrs
- BMI > 25
- Prior history of GDM or abnormal glucose test
- Family history of DM in first degree relative
- Obstetric history: Prior macrosomic infant or unexplained fetal death
- Race: Asian, Hispanic, Native American, Black

Initial Screen

- 50 gram glucose load consumed by nonfasting patient
- Serum glucose drawn 1 hour later
- Threshold<140 mg/dl
  - Correctly identifies 90% cases
  - Lower thresholds may be used

Confirmatory Testing

- 3 hr 100-gm glucose challenge
- Fasting and 1,2 & 3 hours post-consumption glucose levels drawn
- Positive test: 2 or more values exceed accepted thresholds
- Acceptable thresholds:
  - Carpenter/Coustan: 95/180/155/140
  - Natl Diabetes Data Grp: 105/190/165/145

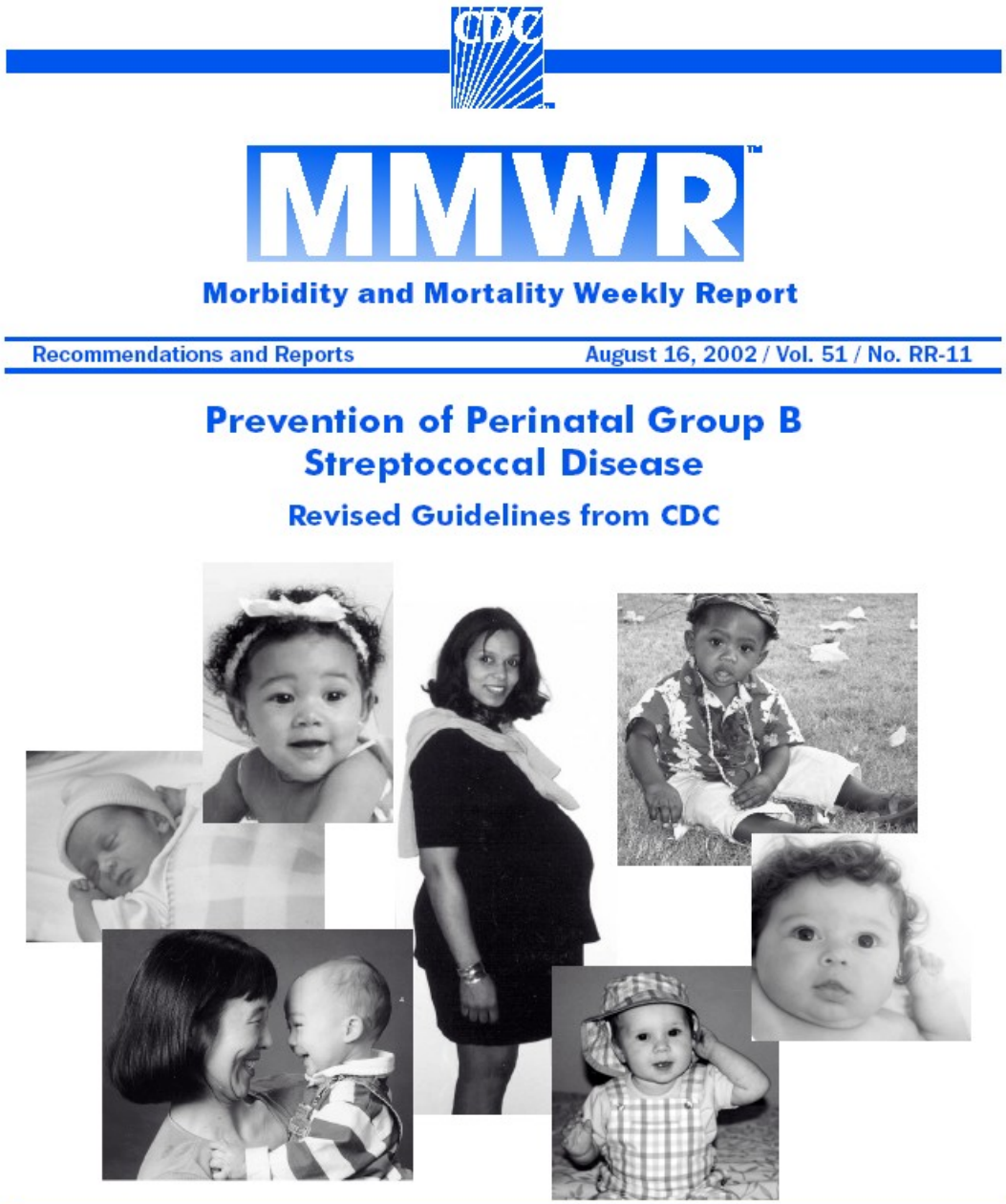
Third Trimester Care

Prenatal care in the 3rd Trimester

- Purpose: Ongoing risk assessment & preventative counseling
- Components: Add in assessments of
  - fetal lie
  - cervical exams
  - postdates testing
- Patient education: Prepare for delivery!
- Screening for Group B strep (GBS)

Screening for GBS

- Why do we do it?
  - Early onset GBS disease is the leading infectious cause of illness and death in US newborns
  - Administering intrapartum antibiotics (IAP) to colonized women prevents invasive disease in infants



The Recommendations

MMWR, Vol 51 (RR-11)

Who do we screen?

- Universal prenatal screening at 35-37 wks gestation
  - Exceptions: previous infant with invasive GBS or GBS bacteriuria during current pregnancy
- Risk based strategy reserved for women with unknown GBS culture status at the time of labor

www.cdc.gov/groupBstrep

How do we screen?

- Site: lower vagina and rectum
  - single swab or two swabs
  - through anal sphincter
- Timing: 35 to 37 weeks
- Collection: speculum NOT required
  - self collection an option
- Processing: selective broth medium
- Sensitivity testing: if PCN allergic

Indications for IAP

- Previous infant with invasive GBS disease
- Positive GBS culture during current pregnancy
- Unknown GBS status and any of the following:
  - Delivery at <37 weeks of gestation
  - Amniotic membrane rupture ≥18 hours
  - Intrapartum temperature **≥100.4°F (≥ 38.0 °C)**

www.cdc.gov/groupBstrep

Intrapartum Prophylaxis Not Indicated

- Previous pregnancy with a positive GBS culture (culture negative in current one)
- Planned cesarean delivery performed in absence of labor or rupture of membrane (regardless of maternal GBS status)
- Negative vaginal and rectal GBS screening in late gestation during current pregnancy, regardless of intrapartum risk factors

Agents for IAP

Regimens	**Antimicrobial**
Recommended	Penicillin G 5 million units IV, the 2.5 million units q4 hrs until delivery
Alternate	Ampicillin, 2 g IV initial dose, the 1 g IV q4hrs until delivery

www.cdc.gov/groupBstrep

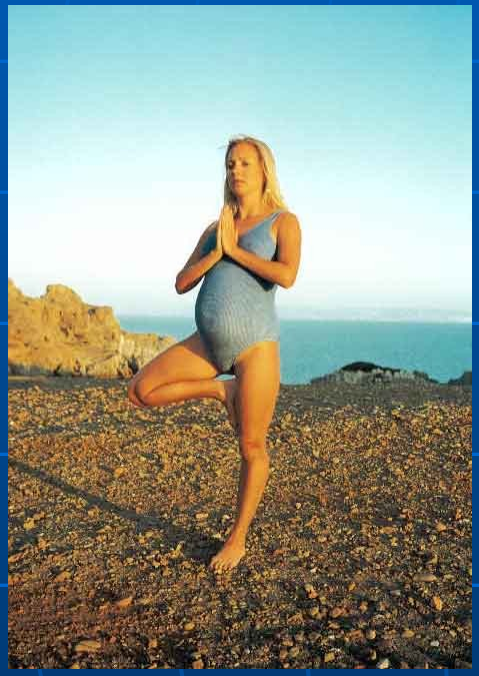
Agents for IAP if PCN allergic

Patient not at high risk for anaphylaxis	Cefazolin, 2g IV initial dose, then 1 g IV q8hrs
Patient at high risk for anaphylaxis • GBS susceptible to clindamycin & erythromycin	Clindamycin, 900 mg IV q8hrs or Erythromycin, 500 mg IV q6hrs
• GBS resistant to clindamycin or erythromycin or susceptibility unknown	Vancomycin 1g IV q12 hrs

www.cdc.gov/groupBstrep

Prenatal care....

- Begins with preconception counseling
- Involves continuous risk assessment
- Represents a key time for preventative counseling and interventions
- Ultimate goal: Healthy outcome for mom and baby



Questions?